Management decisions and technology trends

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1987 is not the year of anything in particular and yet it is a year in which much change will occur in our industry. It is also a year—like most years recently—in which managers of information systems will need to make important decisions that will have a long range effect on the success or failure of their organizations. Decision in times of change and imminent change is tough and scary, and yet unavoidable. Perfect information (a crystal-clear crystal ball) is as scarce as ever and there are no guarantees that decisions, however carefully considered, will appear solid in next morning's brighter light.

Today, there is much more pressure on Information Systems and their managers. We need to provide information of better quality, more quickly, to larger numbers of users, at lower costs. Also, at the very same time, we need to provide information via a strategy which will make profit-oriented organizations more competitive, both within the U.S. marketplace and, perhaps more importantly, in international markets. If we work in the government or non-profit sector of our economy we need to learn how to make more and more from less and less.

And we need to perform this already tough assignment in an environment in which vendor's product lines and strategies are shifting, and our end user customers are continuously redefining and upgrading their information needs.

But we are not without tools to meet these demands—or without hope that success is possible.

THE DECISION MAKING PROCESS

Making decisions about what information systems equipment to buy, when to buy it, and how to use it has changed considerably in the last few years. With the advent of the personal computer, end users and their managers now play much more of a role than before. Sometimes, they select who will get what—and when, picking from products and services pre-selected by their MIS department or by a committee of technologists and users. In other companies, they may make these selections entirely on their own, providing they fall within budgetary guidelines and authorities. Some companies require elaborate studies and precise systems design; others proceed on an ad hoc basis, adding technology where users or their managers identify a need and a solution, and often building the system in place as needs evolve and grow.

THE UPWARD EXPANSION OF USER CONTROL

Initially, user involvement in the selection process—and user-driven systems management—was focused on the personal computer, on small, inexpensive, individually used workstations. However, as systems grew and (importantly) as users became more sophisticated in identifying needs and aggressively seeking solutions, the user began to extend his control upward, toward the multi-user system.

This desire to control a larger and more complex information systems world was substantially aided by various technology trends.

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At the same time, the skills needed to manage minicomputer systems, especially small ones, started to shrink. Vendors eager to sell more systems and to extend their marketing into the end-user arena (particularly because this market was deemed less controlled by IBM, with its traditionally close relationships with the management of large MIS users) offered various “user friendly” tools and interfaces to make the job of systems management more and more structured and predefined. Anyone who could read the screen of the computer could perform most administrative and maintenance tasks for such systems. Frequently that anybody was a departmental clerical or secretarial employee; a considerable cost savings to the organization.

The local area network (LAN) market began to solidify. A few major vendors substantially controlled the market and offered stable, well defined, and increasingly feature-rich products. IBM entered the market, offering long-term commitment of the LAN concept and enhanced credibility. LAN software began to appear which, together with LAN's and servers (themselves often low-cost PCs) offered an inexpensive, appealingly simple environment. Also, such LAN environments, particularly if purchased a piece at a time, incrementally to the original purchase of personal computer workstations, fell well within departmental budgetary guidelines.

This meant LANs often arrived in end-user departments (particularly in those in remote locations) without notice to
the MIS department at all. In fact, MIS departments often found out about these installations when they offered plans for company-wide guidelines or implementations and found—to their chagrin—that they already had a de facto standard in place.

Other technology trends have also altered the decision making process. Many organizations are combining their telecommunications departments (both telephony and data communications) into their MIS function. Office automation, end-user computing and microcomputer support and management are also candidates for integration with the MIS function. This offers MIS an opportunity to provide more integrated planning and more integrated systems design and support. It also offers the opportunity to consider some of the new combined function hardware which it was difficult for companies with separate computer and communications functions, for instance, to contemplate, analyze or implement.

1987 TECHNOLOGY ACTIVITIES

What are the technologically centered trends we are likely to encounter in 1987? And how will they affect the Information Systems management process. A few likely technology areas to watch include:

The Legitimization of Apple and the Macintosh

Apple’s Macintosh products, especially its newest family member, the Mac II, are robust, powerful personal workstations. Also, there are now more than 2,000 software programs, including personal productivity tools for almost every imaginable area of business endeavor. Too, the consistent interface, powerful performance, and image orientation of the Macintosh has attracted some of the best software; IBM PCs must often wait until later for the products which appear first, more cheaply, and with more features on the Macintosh (e.g. Aldus’ Page Maker and Microsoft’s Word products, to name a few popular packages with first Macintosh and only later comparable IBM PC versions).

With Macintosh II, announced in March, Apple entered a new phase. This Macintosh is open to product enhancement via additional hardware and, perhaps more importantly to corporate America, it openly embraces IBM’s 80286 architecture. Users do not need to choose the simplicity of Macintosh operation instead of the software compatibility of the IBM environment. They can choose both at once.

Market reaction to this product is likely to be aided and abetted by IBM’s activities this spring and the market chaos that may ensue.

The Acceptance of a Next Generation IBM PC-Compatible/Clone Standard

IBM has kept the market waiting, holding its breath, for a very long time—too long. Exasperated competitors like Compaq finally gave in and announced their own versions of -386 Personal Computers (using Intel’s 80386 chip).

Some believe that IBM will announce a different kind of product incompatible, less compatible or compatible only in some strange new way with the previous IBM standard. (Actually, IBM is likely to announce more than one system, with some enhanced -286 machines in the pot for Spring, 1987 and probably one or more -386 models.) This new system from IBM seems very likely. But the market reaction to this event is much less predictable.

Customers could choose to abandon the current IBM PC standard, agree with IBM’s greater wisdom, and follow IBM down whatever paths it chooses. But customers could also choose to stay in a comfortable, well-defined space, richly furnished with innumerable hardware accessories and software packages. If developers’ lag cycles for new software remain long, and/or if developers continue their love affair with the Macintosh, and/or if the end users decide the industry standard has already been determined and cannot be redefined by a single vendor, even IBM, Compaq, and the standard continuers could triumph and IBM could stumble.

Apple could be a more than modest beneficiary in this scenario. If Apple is carrying the standard and combines the two most popular software environments, it could become a preferred product in environments (like big corporations) where it was previously overlooked, ruled an outlaw, or scorned.

LANs Replace Minicomputers as the Basis for Departmental Systems

The day of the departmental processor (read minicomputer) may be drawing to a close. Minicomputers may be too big, too expensive, and too support-intensive to be appealing to the end users who often select department computing power.

Minicomputers, will not, of course, disappear. They will continue in ever-smaller, microcomputer-based versions. They will be attached to larger LANs as servers or sources of additional or specialized computing power. They will serve to interconnect and add function to multiple LAN environments.

More and more robust LANs with more robust operating systems and substantially more multi-user software will increasingly be the selection of choice, based on ease of use and price.

Image-oriented Applications Will Change Our Workstation, Our LAN, and Our Storage Hardware Requirements

Graphics, rich word processing desktop publishing, and icon interfaces are changing our standards for workstations. Such applications require more robust workstations, with substantially larger memories and faster processors. Also, image-oriented applications and their software need substantially more storage: a single bit-mapped 8.5 x 11" page can contain 1,000,000 bits of information. This means it’s easy to fill entire hard disk drives with only a hundred or so large images. Color (still uncommon in these applications, except for low resolution business graphics and higher resolution engineering graphics) multiples the memory, processing, and storage...
problems by three (and doubling resolution quadruples all the hardware requirements).

Optical storage is sure to be an element in solving this problem. In both CD-ROM and WORM (writable) Optical Disk forms, optical storage is now solidly in the market, with commercial products multiplying rapidly. These products need to be built directly into larger systems, rather than being offered as specialized, separate components. Also, the necessary software for automatically indexing and quickly retrieving information on optical disk needs to be nurtured, in order to manage such vast amounts of images and other data.

CD-ROM, which seems to be the medium for the reference library of the future may actually be a consumer product some day—but it seems destined to be a business product first. CD-ROM pricing for monthly services can easily compete with less information rich paper products and can be substantially cheaper for large, elaborate annual or semi-annual publications.

LANs will also need to accommodate this flow of enhanced information. We suspect that many of the early LAN designs will be too narrow and slow to carry the fast-moving, rainbow-colored information of this brave new world. Broadband LANs may see a comeback (after their retreat into academe) and enhancements to baseband technology will be critical to support these applications with reasonable performance.

The Division of the Software Market

1986 was the year when the software market started to divide; this trend will continue strongly into 1987 and beyond. This is simply a recognition of a natural end to the usefulness of emphasizing backward compatibility of new software to old hardware and the new hardware becomes more and more robust. The compromise required for this backward capability is simply too expensive.

Instead, there will be a division between software which truly exploits -286 machines and older software designed to run successfully on less powerful computers. Desktop publishing is one of the applications which will mark this line, with many desktop publishing packages simply too complex and feature rich (to say nothing of their image requirements) to fit on smaller, less powerful systems. There will be a similar division in 1988 when the first -386 software hits the market. The 68000 market is likely to have similar divisions, with software which exploits 68020 machines just too hungry to fit on older models.

The Upward and Downward Expansion of Software

A strange but necessary game is beginning to play itself out in the software market. A number of microcomputer software developers are trying to create viable multi-user versions of their products for use on LAN servers and minicomputers. At the same time, mainframe and minicomputer software developers are attempting to create microcomputer versions of their products.

This game has gone on for a long time, but previous success stories have been few. Lack of success has largely been caused by developers’ assumptions that their new target market is simply a larger (or smaller) version of their current market. Actually, multi-user software environments require an entirely different, much more complex view of the world. And smaller environments aren’t just smaller—they typically have users who demand much friendlier products. Failure, coupled with the rewards of success, however elusive, have fueled a new look at cross-system software and some successes seem likely to appear in 1987.

THE ISSUE OF COMPETITIVENESS

If information systems—and their managers—are to play a major role in the life and success of the organization, they need to contribute to the competitiveness of the firm. Thorough examinations of individual businesses nearly always uncover a number of areas in which better information systems (or better use of the ones already in place) can significantly improve the health of the organization. Likely areas for inspection might include:

1. The timeliness of information, particularly if faster delivery of data or analyzed data has a financial value to your organization (such as improving time to market, speeding up collection cycles).
2. The accuracy of information, especially where greater accuracy permits better decision making. This might be particularly true in consumer goods, for instance, where changes in market share of less than one percentage point can be critical.
3. Other uses for information. Information created for, or as a by-product of, one business can create other businesses. For instance, information about large groups of customers and their behavior might be valuable to other firms in their market research activities. Or an analysis of the demographics of your customers might lead you to provide other goods and services (some might be information-based) to them.
4. The integration of information. Single facts by themselves, particularly on separate, incompatible computer systems, don’t tell you much. Combined in meaningful ways, these facts can give you new insights into your organization and how it should be managed. New products which cross system boundaries, and aggregate and analyze information on behalf of managers with limited computer expertise can greatly increase the information available for decision making.
5. Alerting. Computers can become agents, tracking multiple events in ways too large or too complex for the human brain to readily handle. They can be programmed to look for specific events or combination of events and to alert their human managers to act—or even, in some circumstances, act on their behalf. (A chocolate company might ask that its purchasing system automatically buy additional cocoa beans whenever the world price exceeded a certain value and bad weather was threatened in cocoa-bearing areas, for instance.)
This is an example, on a very small scale, of a so-called expert system, a computer program that embodies the knowledge of one or more experts about a particular narrow specialty. Expert systems are now coming into their own, and we expect them to blossom all over the largest companies—and some small, insightful ones—during 1987.

Change in the computer industry will not be well behaved in 1987. It will be rapid, unruly, and sometimes unpredictable. Some vendors—especially those who are flexible and fleet of foot—will do well in this era; others will find their stately style ill-served by a rapidly changing environment. User fortunes will rise and fall on the firm’s ability to recognize appropriate technology and appropriate technology partners, and to reject technology that is premature or irrelevant.

Companies that move quickly to adopt relevant technology, and to adapt it to their own ends, will do best of all.